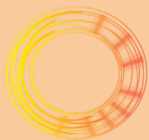


Memory Lab: Introduction to Audiovisual Preservation

Webinar #4

Friday, April 9, 2021



CALIFORNIA
REVEALED

Memory Lab
Network
dc public library



California
STATE LIBRARY
FOUNDED 1850
PRESERVING OUR HERITAGE. SHAPING OUR FUTURE



INSTITUTE of
Museum and Library
SERVICES



Memory Lab Webinars

January: Memory Lab Model(s)

February: Goals & Expectations

March: Intro to Digital Concepts

April: Intro to Audiovisual Preservation

May: Equipment Set Up, Workflows, Troubleshooting

June: Training Staff

July: Evaluating

August: Sustaining & Expanding

Register: <https://californiarevealed.org/memorylabs>

MLN Deep Dive: <https://memorylabnetwork.github.io>

Memory Lab Brown Bags

Permalink: <https://californiarevealed.org/islandora/object/cavpp%3A14208>



Join Us!

CopyCat Grantees:
Tuesday, April 20th, noon

Come one, come all:
Tuesday, April 27th, noon

RSVP: pvadakan@californiarevealed.org

Main Concepts

- Audiovisual Formats
- Digitization
- Metadata
- Quality Control
- Digital Preservation



Introduction

- Analog AV material requires digitization for preservation
- Digital AV material does not require digitization



Preservation & Access

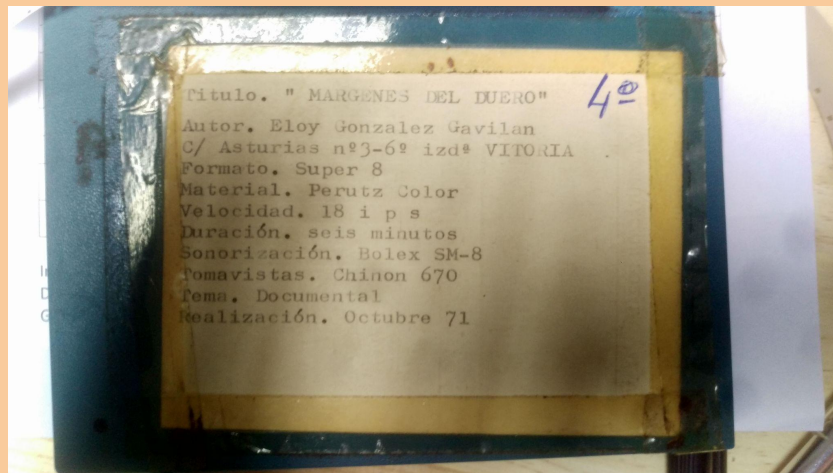
- Preservation
 - Digitization/Reformat
 - Digital file format
 - Preservation storage format
- Access
 - What is your access platform?
 - Metadata for patron searching and browsing

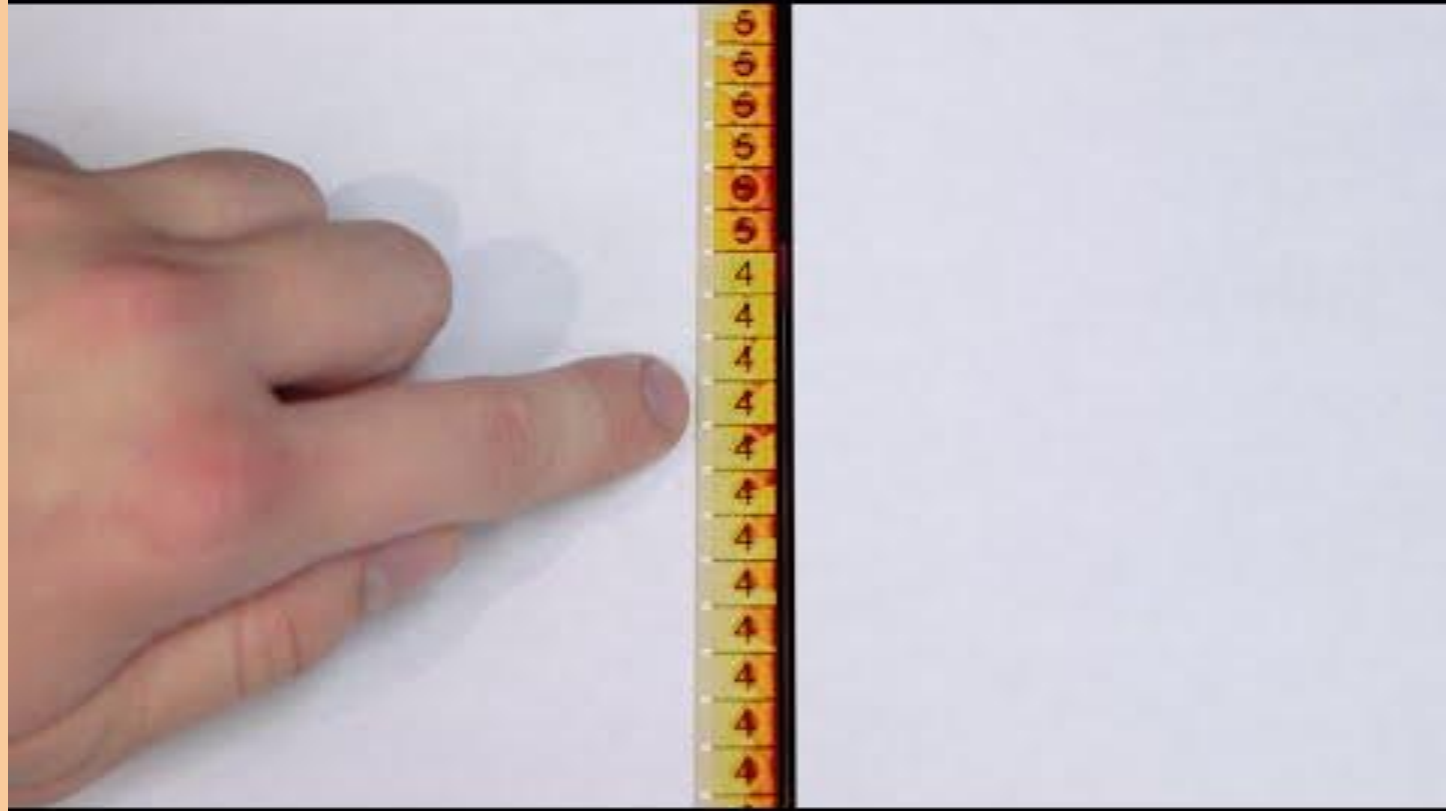
Intro to Audiovisual Preservation: Digitization Fundamentals

- Identification, selection, organization
- Analog to digital signal conversion
- Standards
- Calibration of equipment (QA)
- Signal tests & targets (QA)
- File naming & embedding metadata
- Quality control (QC)
- Digital Preservation
- Access

1st Step: Inventory

- Format
- Title
- Unique ID
- Date
- Subject
- Duration
- Container Annotations
- Condition
- Location
- Preservation priority?







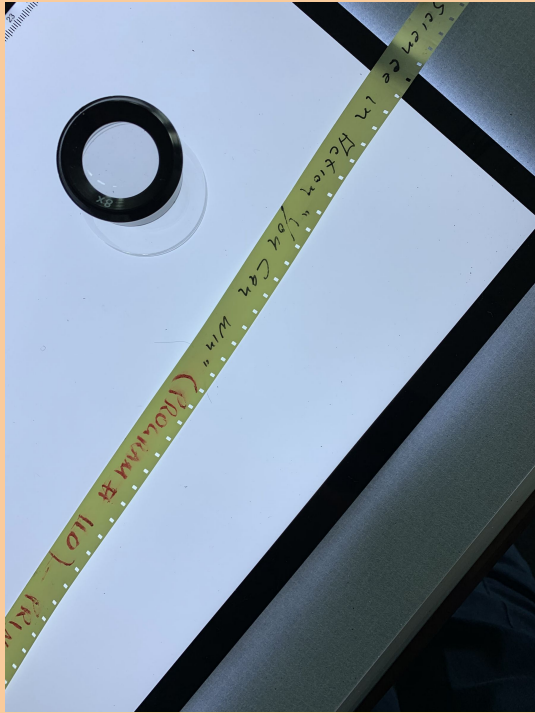
Format Categorization

- Media Type
 - Audio
 - Moving Image
- Material Type
 - Motion Picture Film: 16mm, 8mm, 35mm
 - Magnetic Tape: VHS, Audio Cassette, MiniDV
 - Grooved Discs: Vinyl, Wax Cylinder
 - Audio Only
 - Optical Discs: DVD, Audio-CD
 - Digital Files: .mov, .mp3

What is: Film

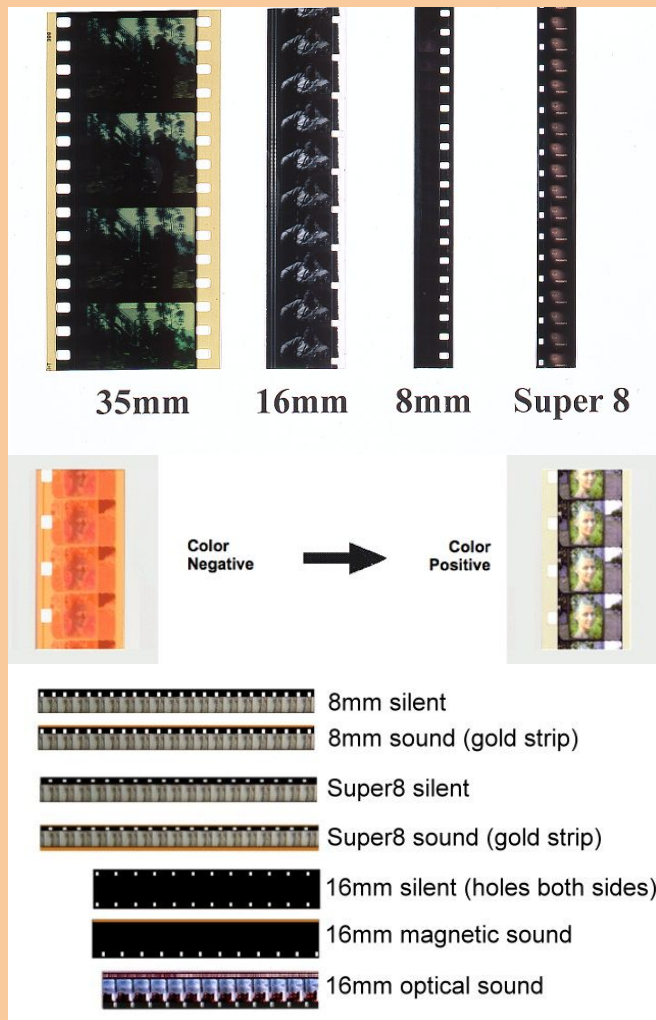


Film Inspection



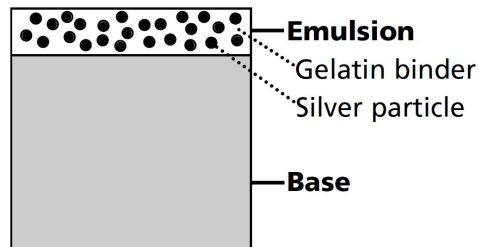
Film

- Gauge
 - 35mm
 - 16mm
 - 8mm/Super 8mm
- Base Type
 - Nitrate
 - Acetate
 - Polyester
- Elements
 - Negative
 - Print
 - Reversal

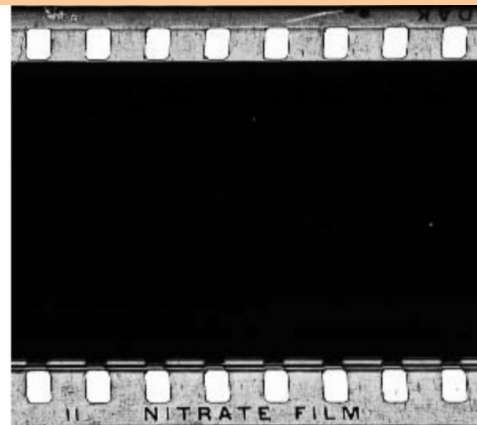


Film Bases

- Nitrate
 - 35mm only
 - Edge Code: NITRATE
 - Stopped manufacturing in ~1952
- Acetate
 - Most common base type in collections
 - Edge Code: SAFETY
- Polyester
 - Polarization test
 - EDGE Code: ESTAR

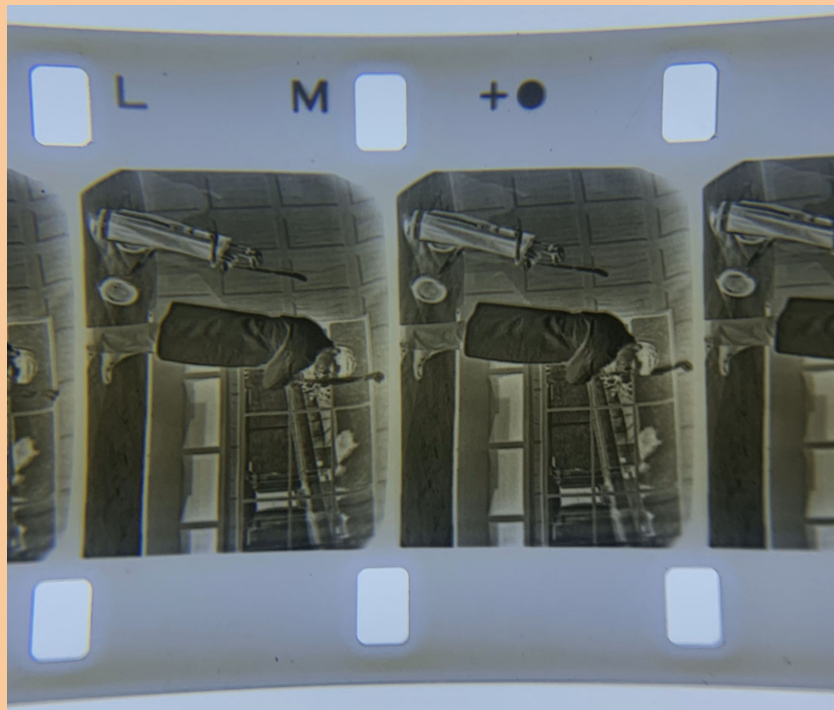


Cross section of black-and-white film.



The words NITRATE FILM appear along the edge of many Kodak cellulose nitrate motion picture stocks.

Dating Films



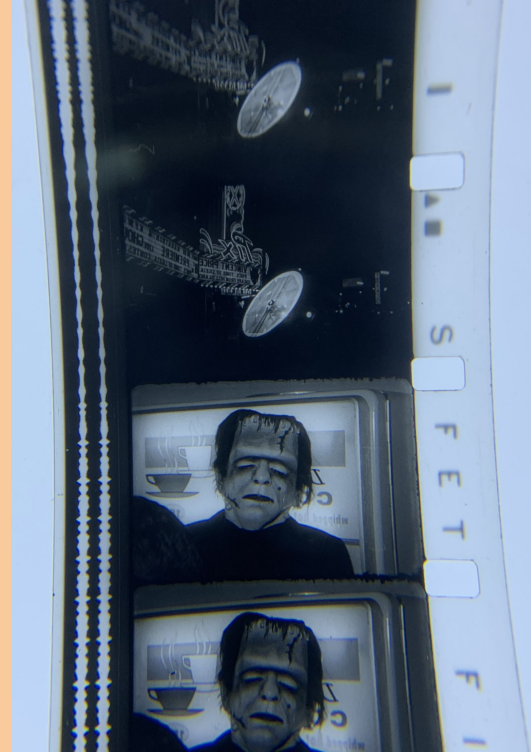
16mm

	US	UK	CANADA	FRANCE	GERMANY
1925	■●	☐—	●☐		
1926	▲●	—☐	●—		
1927	■▲	☐—	●☐		
1928	●●●	☐☐	☐●		
1929	+	+	—●		
1930	▲+	☐☐	☐●		
1931	●+	☐☐	◆		
1932	■+	☐—	◆●		
1933	☐▲	☐+	◆—		
1934	☐●	☐☐	◆☐	☐☐☐	■■
1935	☐■	—+	◆☐	☐☐☐	●●●
1936	+	☐	☐☐	☐☐☐	■●●
1937	■	☐	●—	☐☐☐	●●●
1938	▲	—	●☐	☐☐☐	■●●
1939	●●	☐☐	☐●	☐☐☐	■●●
1940	■■	☐☐	—●		
1941	▲▲	—☐	☐●		
1942	●■	☐☐	◆		
1943	●▲	—☐	◆●		
1944	▲■	☐—	◆—		
1945	■●	—☐	◆☐		
1946	▲●	☐—	◆☐		
1947	■▲	☐☐	●☐		
1948	●●●	+	●—		
1949	+	☐☐	●☐		
1950	▲+	☐	☐●		

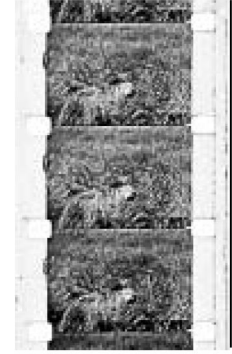
Film Elements: Negative



Film Elements: Positive/Print



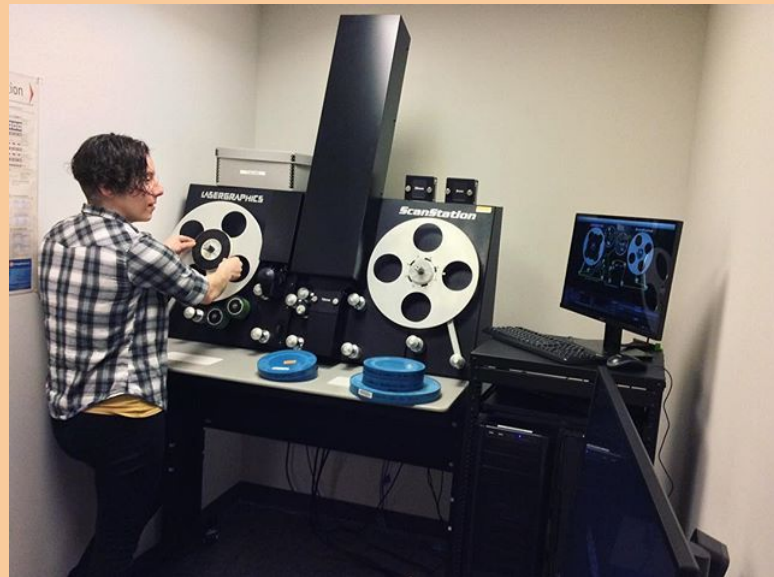
Film Elements: Reversal



In a reversal original (left), the film edge is black; in a print made from a negative, the edge is usually clear.

Film Digitization

- Film Scanners
- Resolution
 - 4K
 - 2K
 - 1080p
- File Format
 - Preservation (lossless)
 - DPX
 - FFV1/MKV
 - QuickTime Uncompressed
 - Access (lossy)
 - MP4
 - MOV

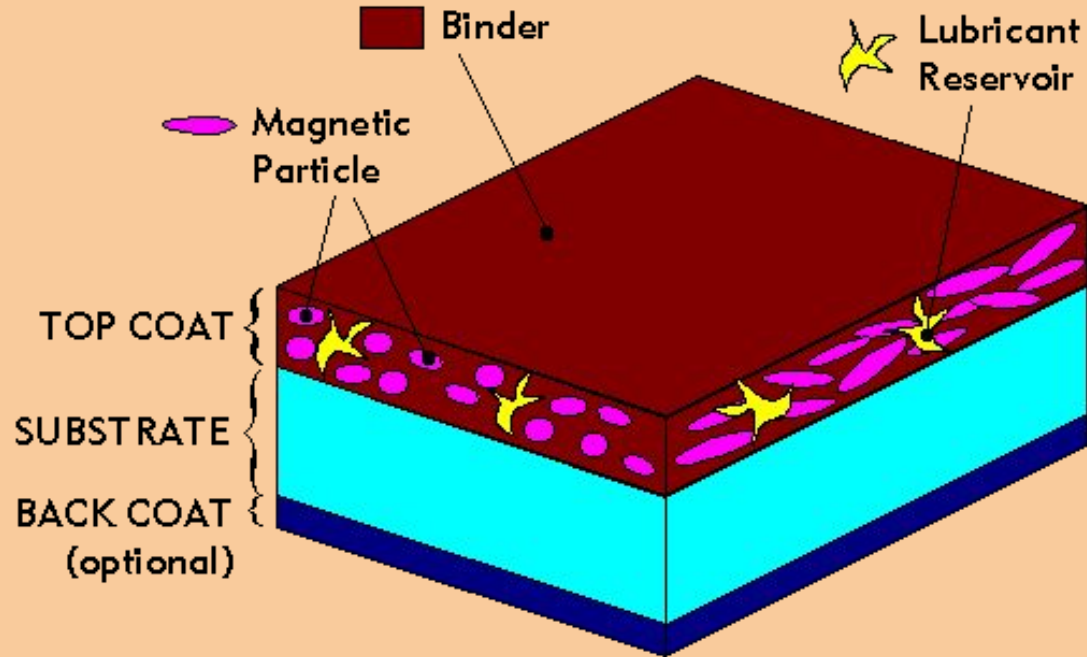


Magnetic Media



- Media Type
 - Audio: Audiocassette, 1/4" open-reel
 - Moving Image: VHS, MiniDV
- Physical Type
 - Open-Reel: Quad Tape, 1" open-reel
 - Cassette: VHS, Betacam, MiniDV
- Encoding Type
 - Analog: VHS, Audiocassette
 - Digital: MiniDV, Digital Audiotape (DAT)

Magnetic Tape



Magnetic Media Crisis

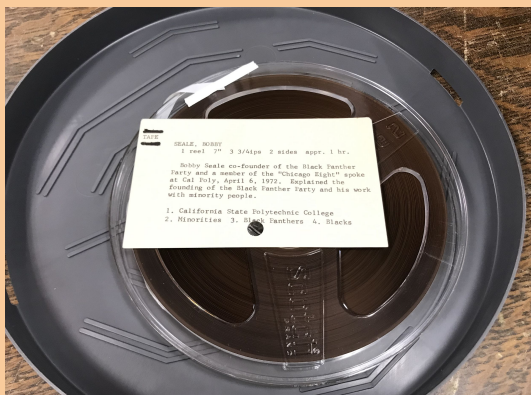
- Degradation
- Obsolescence
- Playback equipment
- Loss of repair and maintenance expertise





Audio vs Video Tapes

- Audio Tape
 - Results in Audio File
 - Audio stream

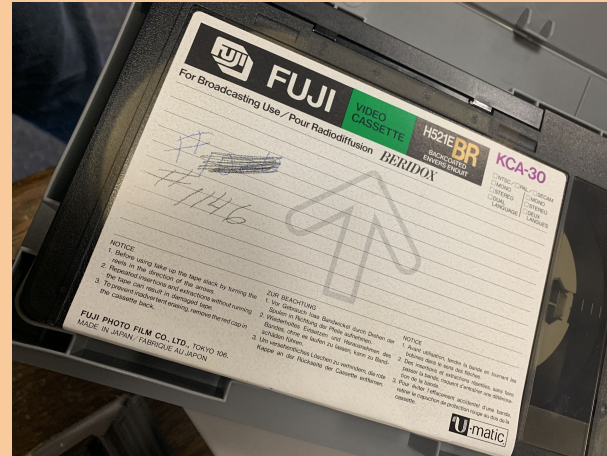


- Video Tape
 - Results in Video file
 - Video stream
 - Audio stream
 - Captions
 - Timecode



Digital vs. Analog Tapes

- Important Distinction
- Both are magnetic tapes that require specific decks to reformat
- Analog tapes require digitization
- Digital tapes require migration of data to a digital file



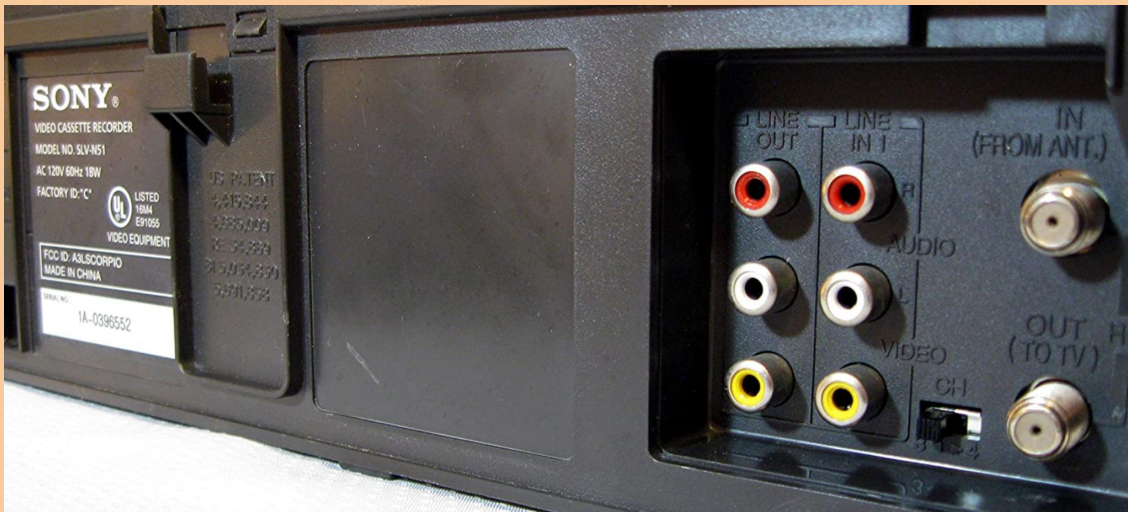
Digitizing Video Tape

- Essential Components
 - Playback Deck
 - A-D Converter
 - Time Base Corrector
 - Computer
 - Cables
- Other Optional Components
 - CRT Monitor
 - Audio Mixer
 - Speakers
 - Headphones
 - Waveform and Vectorscope



Digitizing Video Tape

- Playback Deck
 - Example: VHS Deck



Digitizing Video Tape

- Analog to Digital Converter (A-D Converter)
 - Example: BlackMagic Intensity Shuttle



Digitizing Video Tape

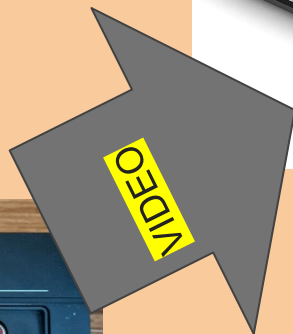
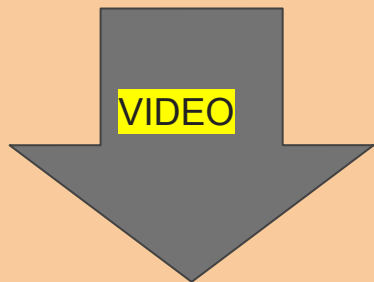
- Time Base Corrector
 - Examples:
 - TV ONE TBC
 - DATAVIDEO TBC-1000
 - Expensive and Rare



rear view



DIGITAL
VIDEO
AND
AUDIO

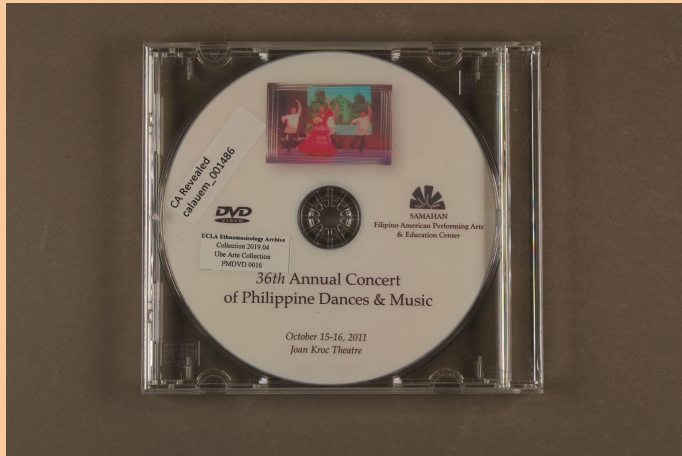


Digitizing Audio Tape

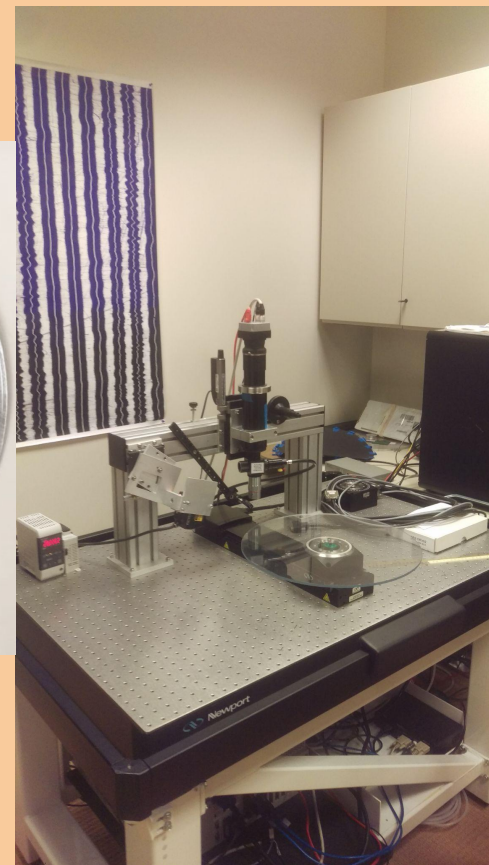


Optical Discs

- Could hold video, audio, or other files
- Migrate to files
- Disc imaging: ISO file format
- Not ideal for preservation or access



Grooved Media





Standards/File Formats/Codecs

- No one-size-fits-all answer
- Lossless (.tiff) vs. lossy/compressed (.jpg)
- Quality matters - aim for highest resolution you can afford
- Lean toward open source and widely available

Recommendations based on media type:

- For audio: WAV + MP4
- For video: 10 bit uncompressed, ProRes + MP4

FADGI Guidelines: <http://www.digitizationguidelines.gov>

California Revealed Statement of Work: <https://californiarevealed.org/partners/sow>

Metadata and File Naming

- Descriptive

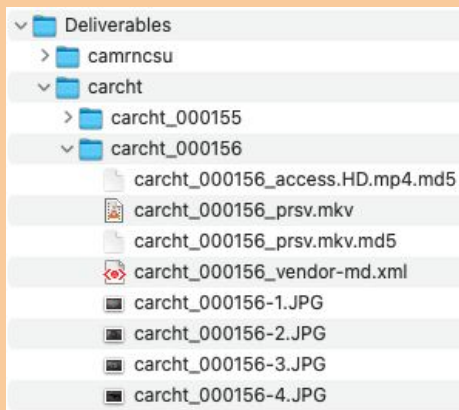
- Title
- Date

- Technical

- Format
- Duration

- Preservation

- Digital file information
- Digitization process information



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Quality Control

- Structure-level QC vs. Individual File QC
- Sampling QC vs Full QC
- Spotcheck: beginning, middle and end
- Technical specifications
- Directory structure and file naming
- Accurate and complete metadata
- Run checksums
- Image/sound quality
- Missing content



Digital Preservation

- Storage media, servers, and the cloud
 - Clearly label and organize hard drives
 - Consult with IT department (if available) about server storage
- Back up 3-2-1(LOCKSS)
 - 3 copies - 2 stored locally on different types of media - 1 offsite in a different geographic location if possible
- Check files annually
 - Place a readMe text file on the hard drive - an inventory of the files and update
 - Create checksums- Fixity is a free tool
 - Turn on drive(s) and try to open files.
- Consider migration as file formats change



Digitization Fundamentals:

Keep your originals!

- Store cool, dry, dim/dark, and pest-free
- Upgrade housing to acid-free containers
 - no plastic bags or papers
- Store film flat and video vertically
- Label and document
- Keep hard copy inventory list with the items

Library of Congress Preservation Guidelines for Digitizing Library Materials

<https://www.loc.gov/preservation/care/scan.html>

DC Public Library's Memory Lab LibGuide

<https://libguides.dclibrary.org/memorylab/resources/physical-stuff>

Questions? Comments?



Thank you! Keep in touch!

Shahed Dowlatshahi
sdowlatshahi@californiarevealed.org

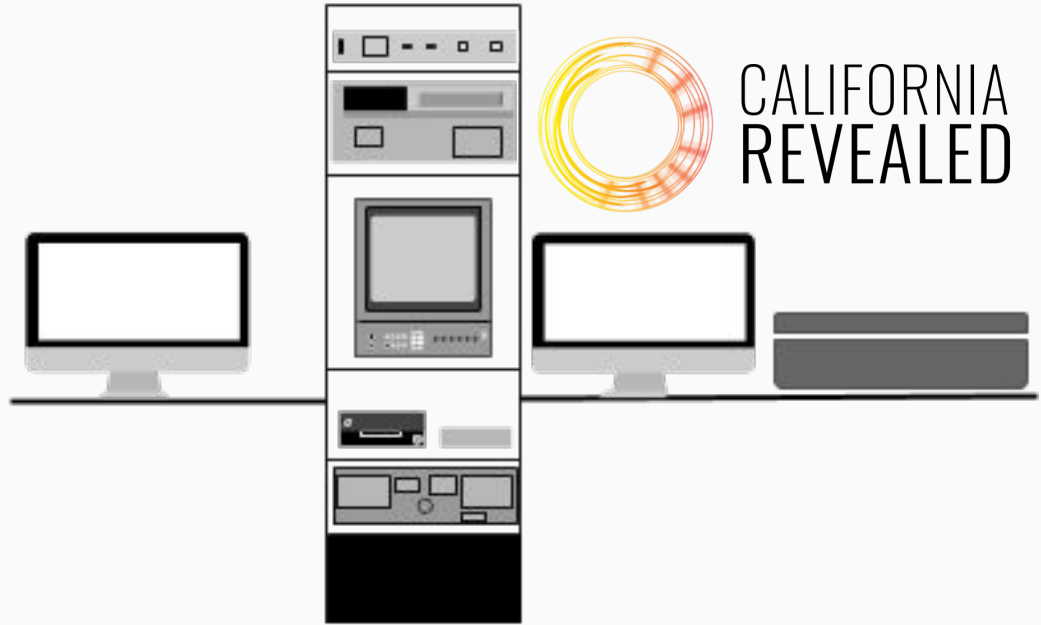
Pamela Vadakan
pvadakan@californiarevealed.org

916.653.5074

memorylabnetwork.github.io

californiarevealed.org/memorylabs

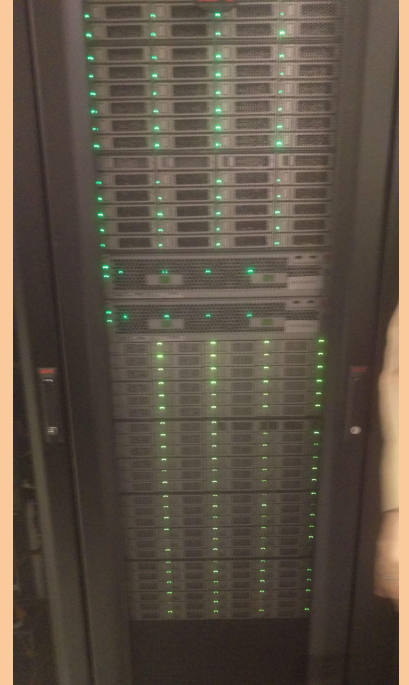
library.ca.gov/services/to-libraries/copycat-grants/memory-lab



NOT PRESENTING
THE REST OF THESE
SLIDES

Digital Preservation

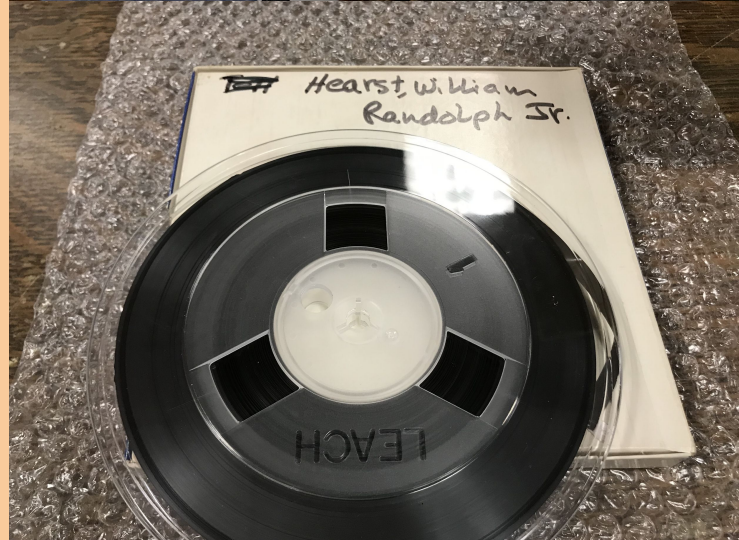
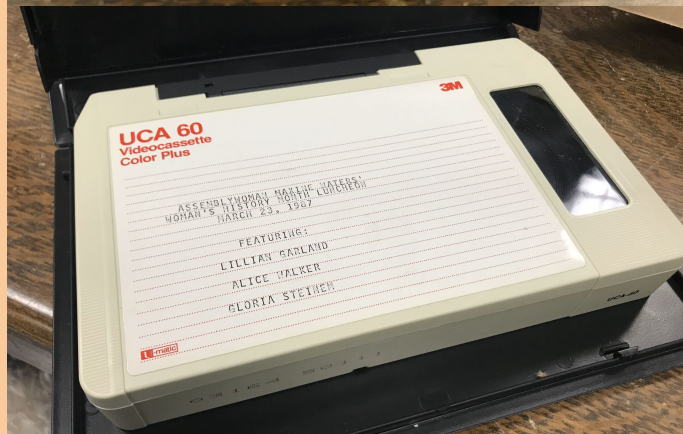
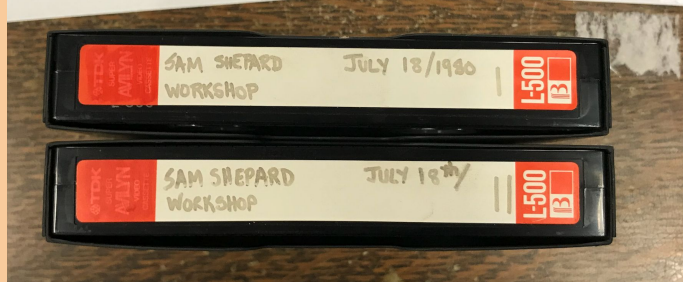
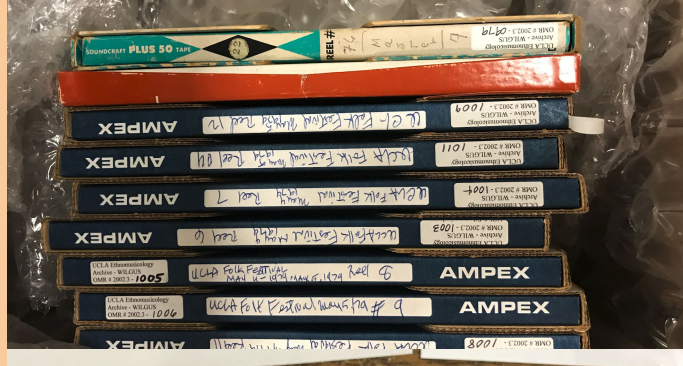
- Digital Storage Formats
 - LTO
 - Servers
 - Hard Drives
 - Cloud
 - Latest Developments
 - DNA
 - Diamonds



Digital Preservation

- LOCKSS
 - Geographic Location
 - Format
 - Number of copies





Overscanning

- Edge-to-edge
- Best practice for preservation
- Replicate film's physical aspects
- Capture edge code
- Capture soundtrack
- Capture condition



Film Housing

Ideal Film Storage:

- 3" core (Polypropylene)
- Ventilated can (Polypropylene)
- No plastic bag or papers
- Cool and dry
- Stack horizontally



Panasonic Best VCR

Made in Japan



One Exception: Film Preservation





DimCare

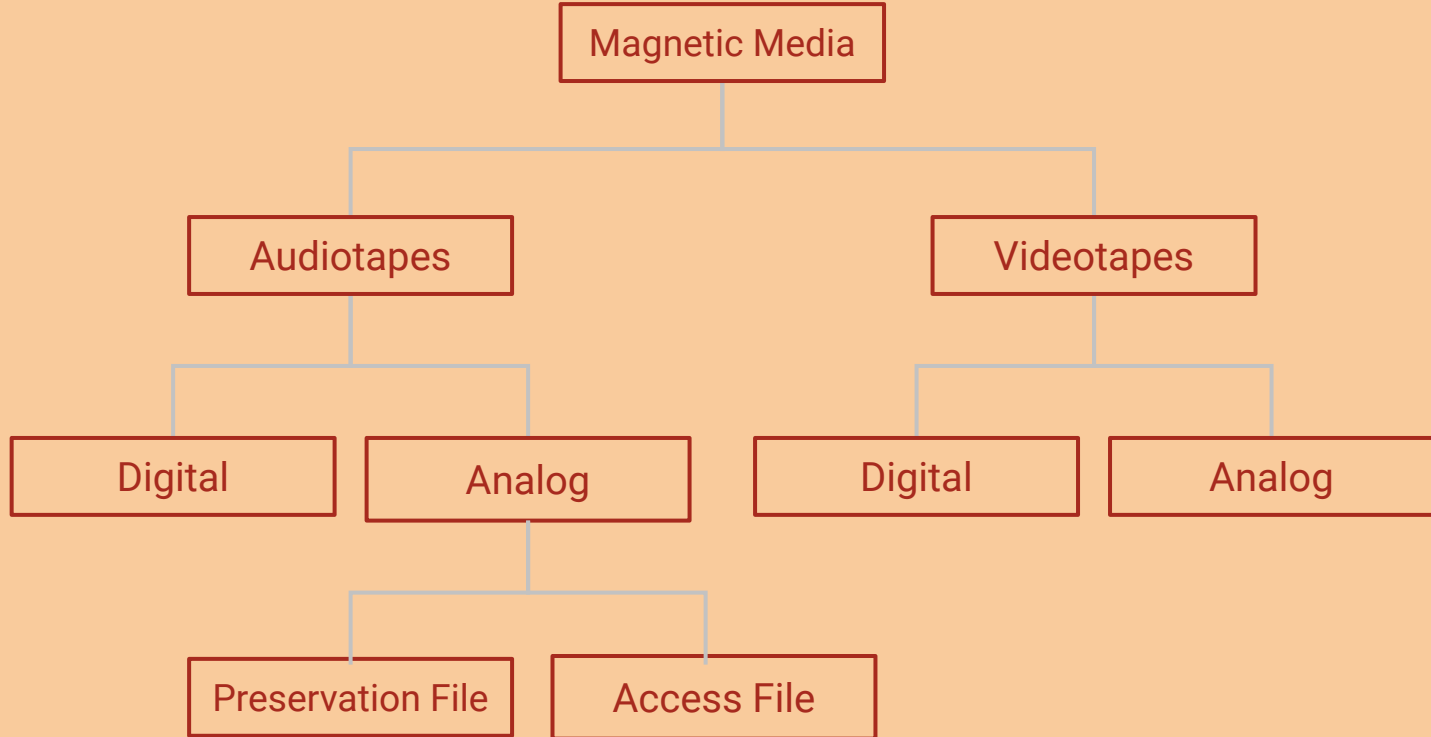
IPM
WHS
PERFORMANCE
INSTITUTE



Resources

- LOC Recommended Formats Statements:
<https://www.loc.gov/preservation/resources/rfs/index.html>
- So

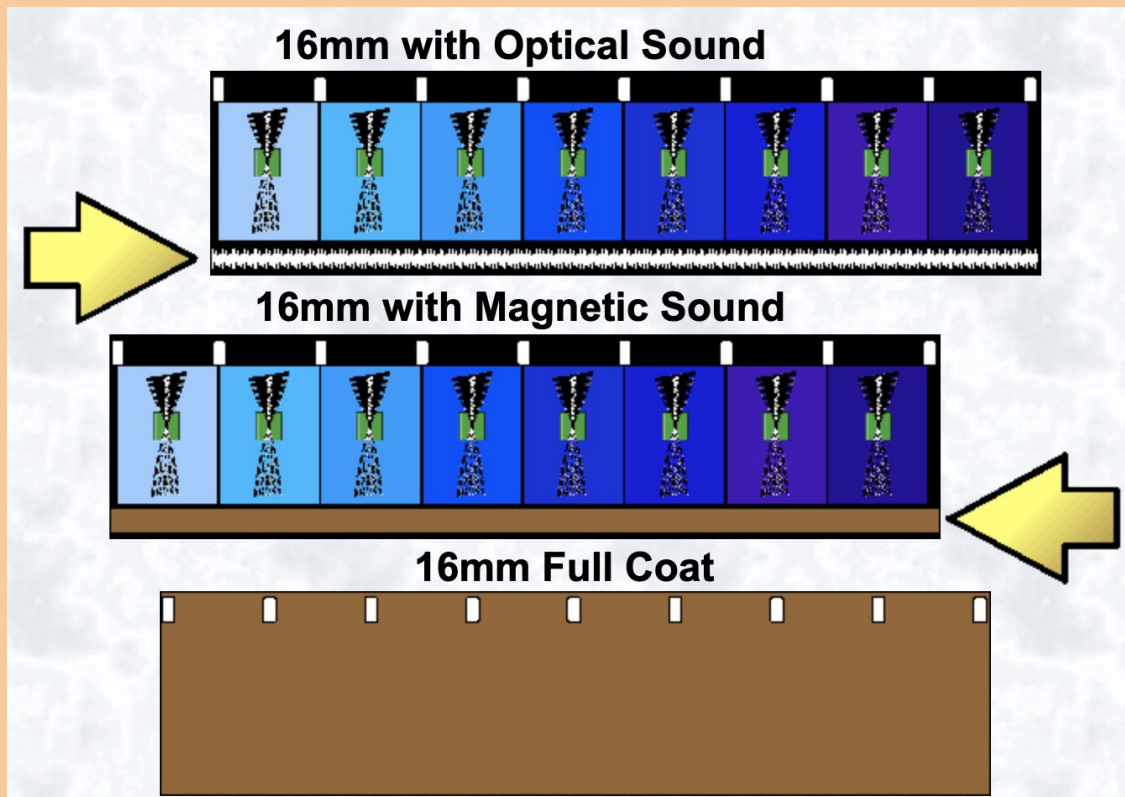
Audio vs Video Tapes



Film Preservation Resources

- Film Preservation Guide
- littlefilm.org
- centerforhomemovies.org
- filmcare.org
- http://www.digitizationguidelines.gov/guidelines/FilmScan_PWS-SOW_20160418.pdf

Film Elements: Sound

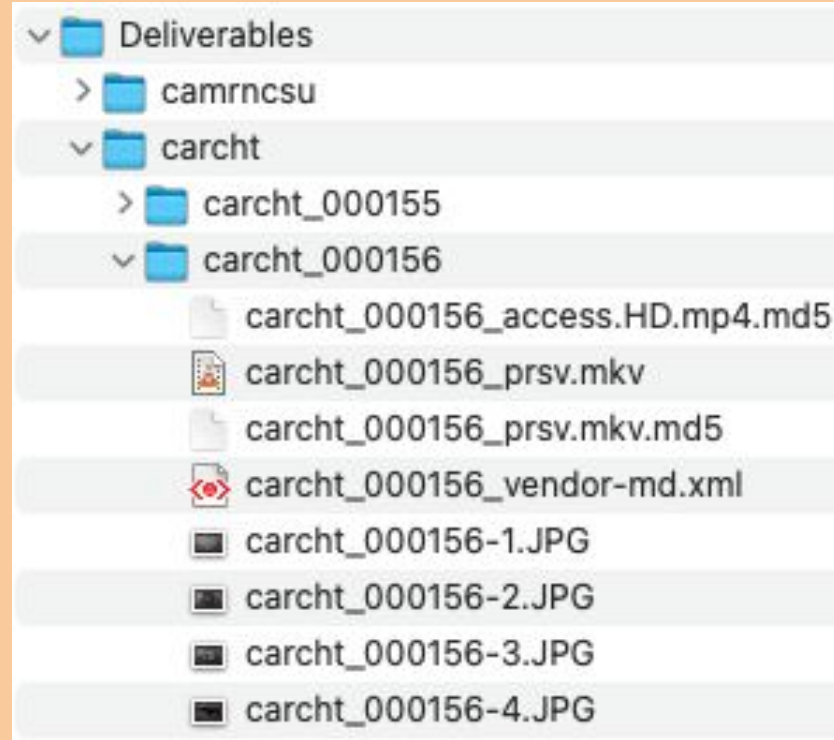




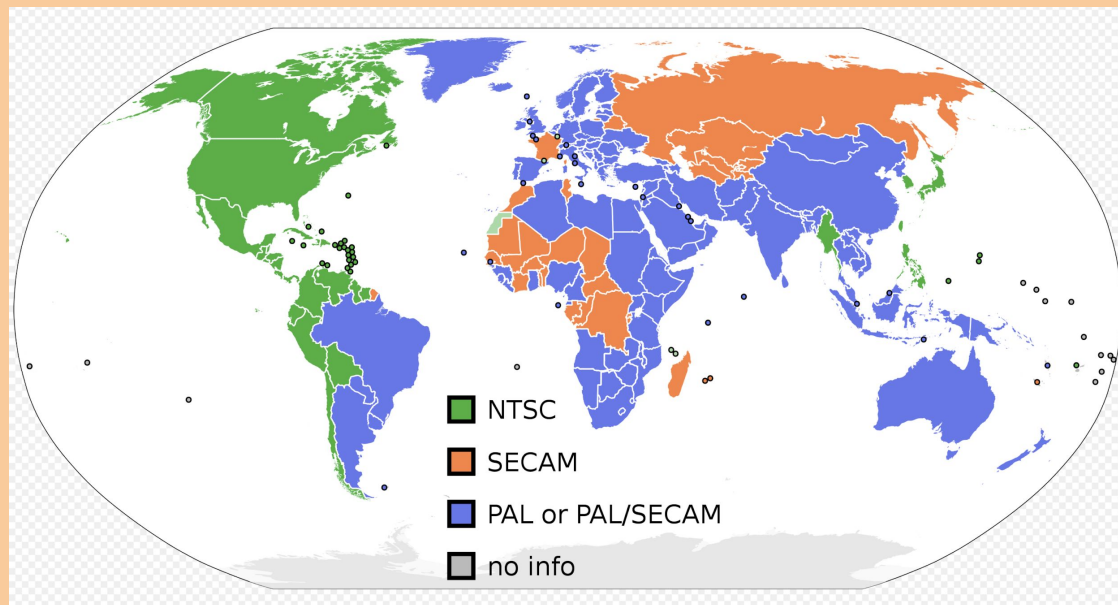
Considerations for Digital Files

- File Naming convention
 - Unique
 - Avoid Special Characters
-
- Directory Structure
 - Preserve relationship of files
 - Describe content succinctly
-

Directory Example

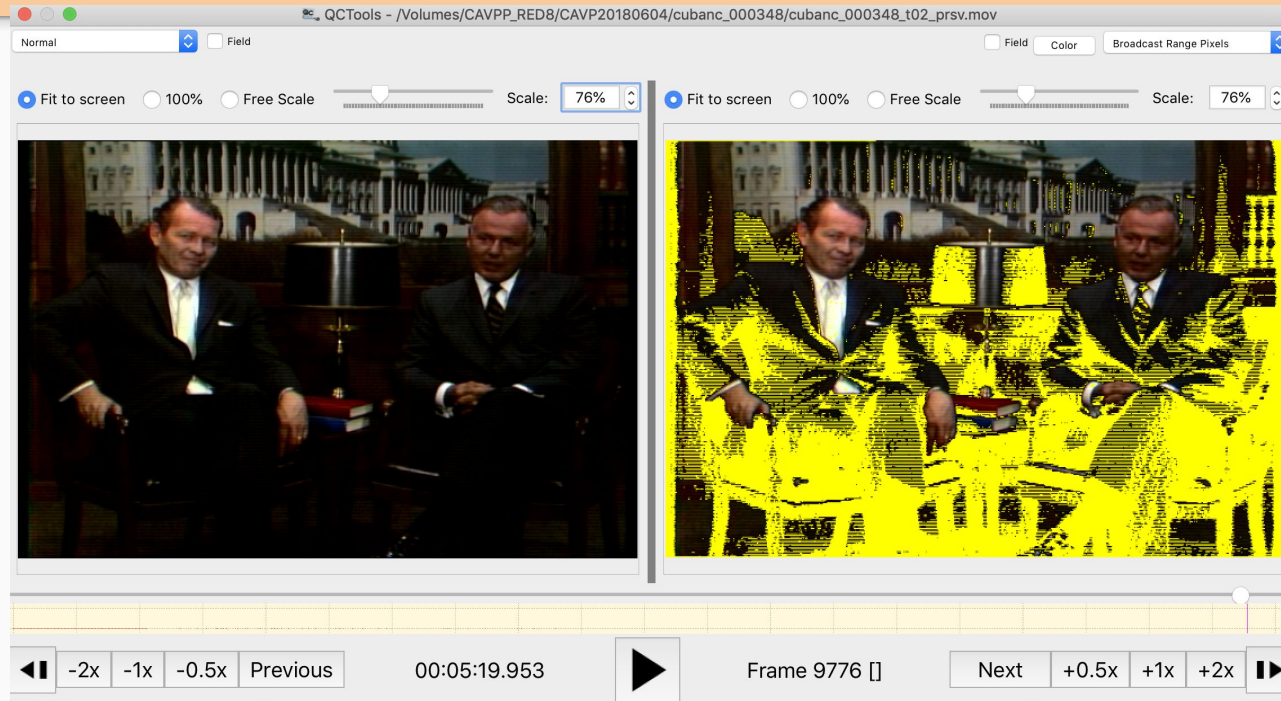


NTSC / PAL / SECAM



Country	Video Format Standard
Afghanistan	PAL
Algeria	PAL
Antigua	NTSC
Argentina	PAL
Australia	PAL
Austria	PAL
Bahrain	PAL
Bangladesh	PAL
Barbados	NTSC
Belgium	PAL
Bermuda	NTSC
Brazil	PAL
Brunei	PAL
Bulgaria	SECAM
Canada	NTSC
Canary Isle	PAL
Chile	NTSC
China	PAL
Colombia	NTSC
Congo	SECAM
Costa Rica	NTSC
Cuba	NTSC

Quality Control



Quality Control

- Structure-level QC
 - Fixity and Checksums: BagIt
 - Technical Metadata: MediaConch
- Individual File QC
 - Playback: VLC Media Player, QuickTime
 - Audio/Video Synchronization
 - Other Technical Aspects
 - Color
 - Black and White levels
 - Audio issues



MediaInfo and MediaConch

- MediaInfo: mediaarea.net/en/MediaInfo
 - Detailed look inside the files
 - File codec
 - Bit depth
 - Bit rate
 - Resolution, etc
- MediaConch: mediaarea.net/MediaConch
 - You provide your ideal file specifications
 - Then you drop in your files into the software
 - The software tells you if your files have ideal specifications



Fixity and Checksums

- What is fixity?
 - “Fixity, in the preservation sense, means the assurance that a digital file has remained unchanged, i.e. fixed.”
 - DPC resource: tinyurl.com/dpc-fixity
- What are checksums?
 - Digital fingerprint of a file
 - Comparing current checksums to a stored value
 - Common types: md5 and sha-256

Baking Tapes



Quality Control

- Sampling
 - Sample a certain percentage of each:
 - Collection?
 - Format?
 - Audio/Video?
 - Pros: Faster
 - Cons: Potential to miss some problems
- Full
 - Fully QC each file
 - Pros: Thorough
 - Cons: Time consuming

Packing

- Labelling
- Organizing
- Weight and Measurement
- Include Paper Inventory
- Materials to Use
- Materials to Avoid



Overhead camera-based digitization setup for a Scanning Day
at the Pacoima branch of the Los Angeles Public Library

Shipping

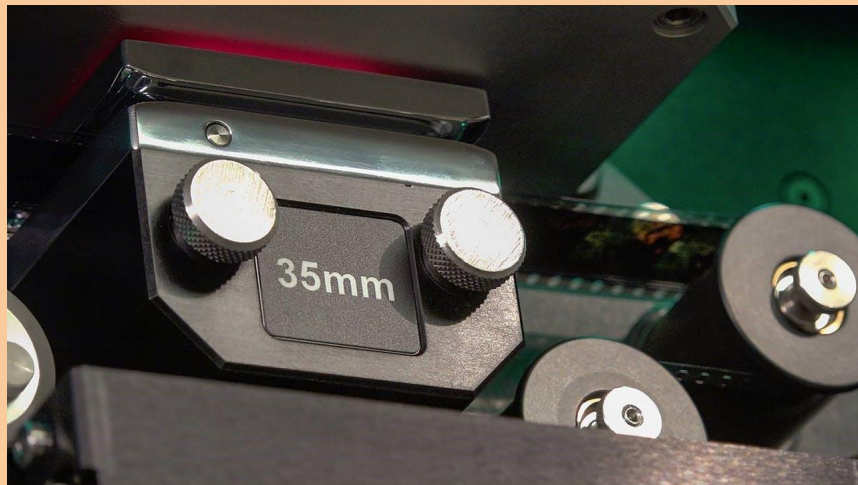
- Choosing a Shipping Vendor
- Number of Days in Transit
- Insurance
- Tracking and Delivery Confirmation
- California Revealed Shipping Guidelines:
tinyurl.com/calrev-ship



Overhead camera-based digitization setup for a Scanning Day
at the Pacoima branch of the Los Angeles Public Library

Film Digitization

- Overscanning
- Sprocket-less scanning
- Audio
- Gates





DIY Memory Lab Video Equipment

- Prosumer and consumer VHS decks
- DVCAM deck
- U-Matic deck
- DVD player
- Monitor
- Time Base Corrector (TBC)
- Analog to Digital converter
- Power conditioner



LOS ANGELES
PUBLIC LIBRARY



DIY Memory Lab Audio Equipment

- Vinyl record player (LPs and 45s)
- Audiocassette deck
- Minidisc deck
- Digital Audio Tape (DAT) deck
- Open reel audio player
- CD player



LOS ANGELES
PUBLIC LIBRARY